QUESTA ENGINEERING CORP.

Civil, Environmental & Water Resources

April 9, 2009

Mr. Jonathan Leech
Dudek
621 Chapala Street
Santa Barbara, CA 93101

Subject: Updated Creek Stability Analysis Addressing the Cancer Center of Santa Barbara Redevelopment Project, Revised Site Plan

Dear Mr. Leech:

This letter represents a summary of my field visit, observations and recommendations for the channel and bank stability on the Cancer Center of Santa Barbara Redevelopment project site. As I understand the current project status, the plan is to remove the existing building located near the top of bank on Mission Creek immediately upstream of the West Pueblo Avenue Bridge and construct a new center in the north eastern side of the property. This review is based on the February 4, 2009 site plan prepared by Cearnal Andrulaitis and March 2009 Preliminary Grading and Drainage Plan by Penfield & Smith The property includes 280 feet of creek length. The current building is approximately 40 to 45 feet away from the centerline of the creek. The new building will be approximately 170 to 175 feet away from the centerline of the channel.

A field visit was conducted to observe the current conditions of the streambed and banks, as well as examine adjacent stream banks upstream and downstream of the project site. The project site is shown in **Figures 1 and 2.** Several large Sycamore trees are present along the upper bank slopes for 200 feet of the bank. The bank slopes are generally 1.5 (H):1 (V) or slightly steeper. The channel bed gradient is approximately 1 to 1.5 percent through the site. The bed consists of mostly 6 to 12 inch cobbles with larger boulders scattered throughout the bed. Some gravel deposits are located adjacent to a scour hole located on the opposite bank beneath a large sycamore (**Figure 3**.). The opposite bank of the creek is composed of a combination of a sackcrete wall, a stone mortared wall, and natural bank slopes. The tree canopy is dense and there is minor under story vegetation that is predominately grass and low creeping exotic vines and plants. The bank slopes are covered in decomposing leaves and are showing small signs of erosion and mass wasting. Previous attempts to arrest this minor erosion have included jute netting and small rock revetment. None of the site's erosion areas pose significant threats to the existing building or future buildings on the site.

Local runoff from the back patio and roof areas of the existing main building is collected in two 6 inch pipes which overhang the bank and discharge into the creek. The Preliminary Grading and Drainage Plan indicates existing surface drainage outlet pipes from the site into Mission Creek would no longer be necessary / used to convey site

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drainage. If the existing drain outlets are removed the bank should be reconstructed as necessary using bio-degradable erosion control fabric and new native riparian plantings. If the drain pipes are cut flush with the slope face, and grouted or slurry-filled from the project side, less damage and need for bank repair would result. According to the drainage plan, surface water run-off for the redeveloped site would be collected and delivered to a combination of on-site dry wells and an infiltration basin. Replacement of the existing run-off patterns (including sheet flow to the creek channel and dedicated drainage outlet pipes into Mission Creek) with the infiltration system proposed by the project should reduce the potential for erosion of the creek top of bank along the project reach.

The Preliminary Grading and Drainage Plan, and site plan, indicate the existing landscape wall on the Cancer Center property which roughly parallels the creek top of bank would be preserved. Minor grading on the inside (project side) of this wall would be accomplished to direct run-off away from the wall, and toward collection systems. No topographic modification is proposed "outside" this landscape wall, or along the creek top of bank. Avoidance of topographic modification in the area along the creek top of bank is appropriate to ensure preservation of the specimen riparian tree species.

The existing stone masonry wall adjacent to the scour hole along the opposite bank of the project site is being under cut (**Figure 4**). If this wall collapses then flow may be diverted to the project bank toe, thereby initiating erosion on the project site. However because the new building will be set substantially back from the top of bank it is unlikely that any new erosion features will immediately impact the structure. It should be noted that neither the sackcrete wall nor the masonry wall referenced in this narrative or depicted in the report figures are on Cancer Center property. The erosion areas on the creek banks opposite the project site did not look particularly recent and may represent modest long-term degradation. It is unknown how deep the footings are but the sackcrete wall appeared to be stable and did not exhibit any signs of severe under cutting. It is recommended, however, that the masonry wall be monitored closely. Conditions found within Mission Creek adjacent to the project site are typical of many of the urban streams throughout Santa Barbara. Channel bed elevation may fluctuate several feet year-to-year based on flow regime and sediment input.

Figure 1. Basic site plan showing the existing building

Figure 2. Project site is along the right bank of the creek. Notice the large Sycamores at top of bank.

Figure 3. Scour hole opposite the project site. Note under cut masonry wall above scour hole

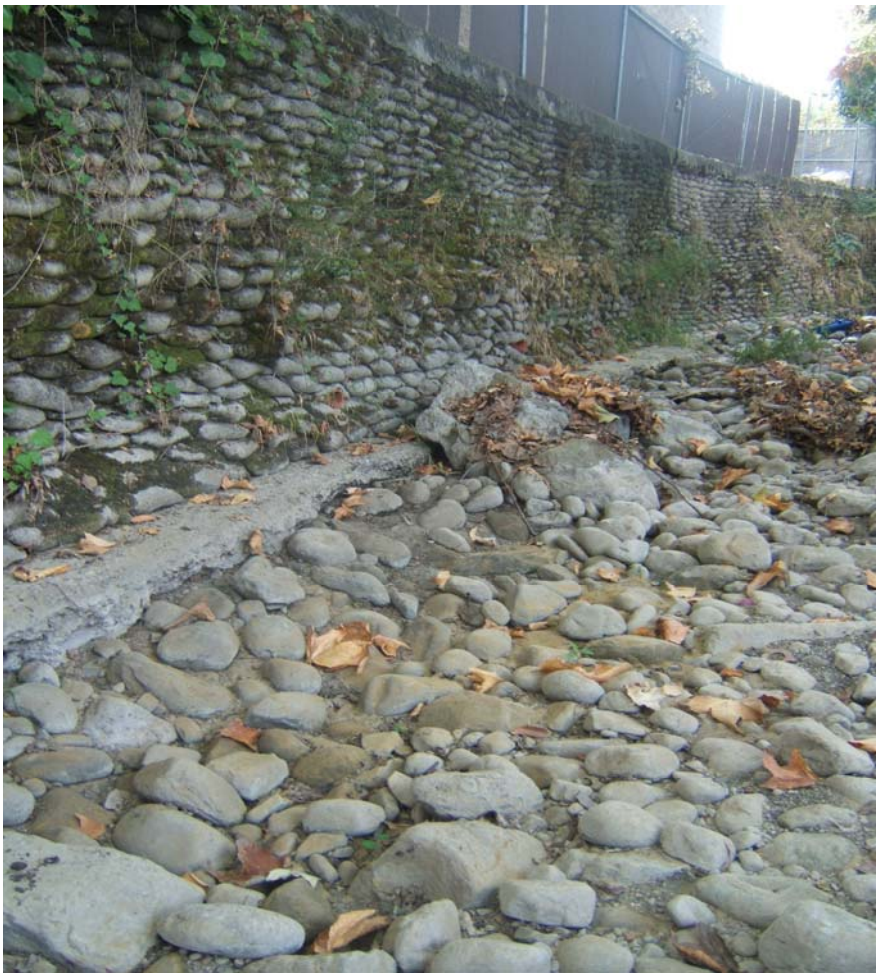

Figure 4. Mission Creek channel – Sackcrete wall (looking upstream)

Conclusions and Recommendations

Owning property along an active creek usually means a certain amount of maintenance and monitoring is required. Small problems if dealt with early can prevent them from turning into big problems later. Generally, the Mission Creek channel through the project site appears to be in good shape and is exhibiting normal erosion features. I see no reason to believe that the banks and existing building on the Cancer Center property are in eminent threat now or into the near future with respect to the incidence of substantial problems.

The channel bed appears to be fairly stable vertically and most of the localized channel scour is occurring along the toe of the opposite bank. The project site is located on the inside of a meander bend, thus channel velocities and scour dynamics are reduced along the project sites banks. The large Sycamore trees at the top of bank are providing key soil stability for the bank and should be maintained in a healthy state. When the existing building is removed from the site, small amounts of bank grading and stabilization will be needed to repair drainage outfalls and other small areas of bank erosion. Care should

be taken that existing vegetation (i.e. the larger trees) are preserved. I believe that no major bank stabilization work should be done on the site at this time, but small areas of erosion can be addressed by using bio-degradable erosion control mats along with a revegetation effort. Minor erosion can be controlled by the application of heavier erosion control blankets made from stout COIR fibers. These mats provide increased scour protection and biodegrade slower, allowing longer time for under story plant establishment. We would recommend products similar to the Rolanka 700 or 900 erosion control blanket. The project site banks will continue to experience minor amounts of erosion and should be monitored, however because the new building is significantly set back, we do not anticipate any major problems in the near future.

Should you have any questions regarding this letter and analysis, please do not hesitate to contact me at 510-236-6114 Ext. 220.

Sincerely,

Sydney Temple, P.E.
Principal

ST/skc

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